The following material was developed during the Alternatives Analysis phase of the Project as a summary of the screening-level analysis and evaluation of cultural, historical, and archaeological resources that could have been affected by the various alternatives that were considered in the Alternatives Analysis. This summary is a portion of the supporting environmental information that was requested by and provided to City Council in addition to the Alternatives Analysis Report during their deliberation and selection of the locally preferred alternative.

Cultural, Historic, and Archaeological Resources

Background, Studies, and Coordination

Cultural practices, as defined by the Hawai'i State Legislature in Act 50, Hawai'i Session Laws of 2002, were evaluated for the various alternatives. These practices were broadly defined as: (1) a traditional cultural practice that is being conducted in an urban setting, and (2) traditions, beliefs, practices, life ways, and societal history of a community and its traditions, arts, crafts, music, and related institutions. Cultural practices include such broad categories as food, dance, physical practices and health arts, museums, flora, religious practices and gathering places, cultural settings, and festivals and ceremonies. To gather information about the identification and impact of cultural resources within the study area, more than 400 letters were mailed to community members and organizations requesting comments related to cultural and ethnic practices and beliefs within the study area.

In regard to historic resources, this project must comply with Section 106 of the National Historic Preservation Act of 1966 (NHPA) and Section 4(f) of the Department of Transportation Act of 1966 because of federal participation in the project. The environmental analysis completed for this proposed project addresses the first steps in meeting the requirements of these two acts. A review of resources along the proposed alignments was conducted to determine if they are eligible for the National Register of Historic Places. Consultation and confirmation of resource eligibility have not been completed.

For archaeological resources, three general categories of resources were identified: burials, pre-contact archaeology, and historic archaeology. With few exceptions, the archaeological resources that could be affected by the project are subsurface features and deposits that have not been previously identified. Such impacts would occur during construction. Once negative impacts from construction (e.g., archaeological resource destruction) and positive impacts from construction (e.g., an increase in archaeological knowledge about O'ahu's south shore) have occurred, no long-term project-related impacts on archaeological resources are expected.

Cultural Resource Impacts

Approximately 1,120 cultural practices and resources were identified in the study area. The cultural practices varied from one-time annual events (e.g., the Aloha

Week festival) to churches or community organizations where cultural activities are regularly held. Each cultural resource or practice was analyzed to assess the following:

- A finding of potential impact on the cultural practice
- Impacts on access to the practice during construction
- Potential impact to the cultural practice during operation or implementation of the project; or
- A finding of no impact.

Potential impacts identified may not be substantial, and may be avoided or minimized with mitigation. Table 1 summarizes cultural practices and resources that may be affected by each alternative. Generally, impacts to resources during construction would include temporary limits on access to resources, or the need to temporarily relocate or reroute resources or events such as parades. Impacts to major events could be avoided by coordinating construction activities around events such as the Kamehameha Day Parade.

The No Build Alternative includes existing transit and highway facilities and committed transportation projects expected to be operational by 2030. An independent cultural impact analysis would need to be conducted for each of these other projects. Accordingly, it was determined that there would be no long-term or construction-related impacts from the No Build Alternative on the identified cultural resources or practices.

Similarly, Alternative 2, Transportation System Management, would include the same committed highway projects assumed for the No Build Alternative. Therefore, the determination was made that there would be no long-term or construction-related impacts from this alternative on the identified cultural resources or practices.

Alternative 3, Managed Lane, would include construction of a two-lane, grade-separated facility for use by buses, paratransit vehicles, and vanpools between Waipahu and Downtown Honolulu. Impacts on cultural resources would be the same for both options under this alternative (Two-Direction and Reversible). In general, no long-term impacts on cultural activities are expected under the Managed Lane Alternative. Along this route, 178 cultural resources were identified and one cultural resource would be directly affected, but not over the long term. Access to 125 of these resources (including the directly affected cultural resource) could be affected during construction (Table 1). Access to small ethnic food shops and cultural activities between Aloha Stadium and Ke'ehi Lagoon Beach Park, including fishing and canoe paddling events, could occur. Access to prominent features, such as the Arizona Memorial and USS Missouri, may be affected. However, there would be no long-term impacts on cultural resources under the Managed Lane Alternative.

Table 1. Cultural Practices and Resources in the Study Area

Alternative	Total Resources	Resources that May be Affected during Construction	Resources that May be Affected during Operation
Alternative 1: No Build			
No Build Alternative	1,120	Not identified	Not identified
Alternative 2: Transportation System Management			
TSM Alternative	1,120	Not identified	Not identified
Alternative 3: Managed Lane			
3a. Two-Direction Option	178	125	0
3b. Reversible Option	178	125	0
Alternative 4: Fixed Guideway (by section)			
I. Kapolei to Fort Weaver Road			
Kamokila Boulevard/Farrington Highway	48	43	0
Kapolei Parkway/North-South Road	15	12	0
Saratoga Avenue/North-South Road	3	3	2
Geiger Road/Fort Weaver Road	47	8	2
II. Fort Weaver Road to Aloha Stadium			
Farrington Highway/Kamehameha Highway	151	112	0
III. Aloha Stadium to Middle Street			
Salt Lake Boulevard	23	6	0
Mauka of the Airport Viaduct	23	11	0
Makai of the Airport Viaduct	23	11	0
Aolele Street	23	11	0
IV. Middle Street to Iwilei			
North King Street	88	43	2
Dillingham Boulevard	34	23	0
V. Iwilei to UH Mānoa			
Beretania Street/South King Street	159	128	0
Hotel Street/Kawaiaha'o Street/ Kapi'olani Boulevard	142	134	7
King Street/Waimanu Street/Kapi'olani Boulevard	148	42	2
Nimitz Highway/Queen Street/Kapi'olani Boulevard	49	45	0
Nimitz Highway/Halekauwila Street/Kapi'olani Boulevard	35	25	0
Waikīkī Branch	109	99	1

In general, Alternative 4, Fixed Guideway, would have few long-term impacts on cultural resources or practices, except in the historic and culturally sensitive areas of Downtown – in particular Kawaiaha'o Church, the Mission Houses, and 'Iolani Palace. The greatest impact on cultural resources would occur during construction when access to resources (including ethnic food shops and religious sites where various ethnic and cultural groups gather) could be affected. The alignments that included a bored tunnel and those that avoid Chinatown and Downtown would cause fewer disruptions. However, some cultural resources and practices may be affected during construction and operation if the project displaces or eliminates a particular cultural practice or resource.

In Section I of Alternative 4, the Kapolei to Fort Weaver Road alignment, the Kamokila Boulevard/Farrington Highway alignment could impact the largest number of cultural resources and practices. Access to 43 cultural resources could be temporarily affected by construction, but no long-term impacts would occur. The Saratoga Avenue/North/South Road alignment would have the fewest impacts: a direct impact to one cultural practice would occur and access to three cultural resources could be affected by construction. Two resources could be impacted during operation.

For Section II of Alternative 4, Fort Weaver Road to Aloha Stadium, construction of the Farrington Highway/Kamehameha Highway alignment could temporarily impair access to 112 cultural resources, but no long-term impacts would occur.

Along Section III of Alternative 4, Aloha Stadium to Middle Street, construction of all four alignments could temporarily affect access to cultural resources, but there would be no long-term impacts during operation.

In Section IV of Alternative 4, Middle Street to Iwilei, the North King Street Alignment would have the greatest impact on cultural resources and practices. A direct impact to one cultural practice would occur and access to 43 cultural resources could be temporarily affected by construction. Two resources could be affected long-term.

For Section V of Alternative 4, Iwilei to UH Mānoa, the Hotel Street/Kawaiaha‘o Street/Kapi‘olani Boulevard Alignment would have the greatest impacts on cultural resources and practices. Direct impacts could affect 17 practices, and access to 134 cultural resources could be temporarily affected by construction. Seven resources could be affected long-term. The Nimitz Highway/Halekauwila Street/Kapi‘olani Boulevard Alignment would have the least impact on cultural resources and practices. Access to 25 cultural resources could be affected by construction, but no long-term impacts on cultural resources would occur during operation. The number of resources that would be affected by the Beretania Street/South King Street and King Street/Waimanu Street/Kapi‘olani Boulevard tunnel alignments would be reduced because they would be constructed using a tunnel boring machine, which would leave the surface undisturbed.

Cultural Resource Mitigation

Transit stations can enhance cultural practices and resources through appropriate interpretive signage in different ethnic languages. In the Kapolei area, transit centers could also provide a venue for traditional cultural stories about the area, including legends and Hawaiian place names. Coordination of construction activities would avoid impacts on traditional ceremonies and festivals, including the Kamehameha Day Parade.

Historic Resource Impacts

The City and County property record search identified approximately 1,000 pre-1965 tax map lots within the study corridor. These properties are not evenly distributed among the proposed transit corridor's various sections. The preliminary list was used to determine resources that were reviewed in previous studies and/or are already included in the State Historic Preservation Division (SHPD)'s State and National Register lists. Resources that had not been previously assessed were reviewed in a field survey. This survey identified buildings and structures that appear to possess distinctive characteristics of a type, period, or method of construction. The fewest pre-1965 resources are located in the Kapolei area, and the most in the Honolulu area (Table 2).

Alternative 1: No Build

No impacts to historic resources would occur as a result of project activities under the No Build Alternative. Transportation projects included in the 2030 O'ahu Regional Transportation Plan would be evaluated individually as each project is developed.

Alternative 2: TSM

Similar to the No Build Alternative, no impacts to historic resources would occur as a result of project activities. Transportation projects included in the 2030 O'ahu Regional Transportation Plan, and any other transit capital improvements, would be evaluated individually as each project is developed.

Alternative 3: Managed Lane

Both the Two-Direction and Reversible options under this alternative could impact the physical environment of 26 historic resources identified along this route. The impacts to historic resources, discussed below, would be the same for either option selected for implementation.

The various historic resources (districts, cemeteries, parks, buildings, bridges, stone paving, curbing, and other such objects) considered potentially eligible, potentially eligible pending further study, or already on the Register(s) along this alternative's alignment could face a loss of integrity of setting, feeling, and association. The loss of these aspects of integrity could result during project construction and operation (long-term impacts).

Long-Term Impacts

Impacts during project operation could include direct changes to physical features of a property's setting that contribute to its historic significance. Specific changes would include infrastructure that is visually incompatible and blocks the view of a historic resource (e.g., the scale of the infrastructure could overwhelm the resource's historic appearance).

Table 2. Historic Resources in the Study Area

Section and Alignment[1]	Pre-1965 Properties	Resources Determined Eligible	Potentially Eligible Resources [2]	Historic Districts (HD) Affected
Alternative 3: Managed Lane (by section)				
Waiawa IC to Hālawa Stream	78	0	9	1 (PH NHL[3])
Hālawa Stream to Pacific Street	63	2	19	1 (PH NHL[3])
Alternative 4: Fixed Guideway (by section)				
I. Kapolei to Fort Weaver Road (5)				
Kamokila Boulevard/Farrington Highway	0	0	2	0
Kapolei Parkway/North-South Road	1	0	1	0
Saratoga Avenue/North-South Road	1	0	3	0
Geiger Road/Fort Weaver Road	3	0	3	0
II. Fort Weaver Road to Aloha Stadium (9)				
Farrington Highway/Kamehameha Highway	173	0	9	0
III. Aloha Stadium to Middle Street (10)				
Salt Lake Boulevard	110	0	3	1 (Palm Circle NHL)
Mauka of the Airport Viaduct	9	0	8	1 (PH NHL[3])
Makai of the Airport Viaduct	21	0	8	1 (PH NHL[3])
Aolele Street	18	0	8	0
IV. Middle Street to Iwilei (44)				
North King Street	94	3	33	0
Dillingham Boulevard	49	2	12	0
V. Iwilei to UH Mānoa (141)				
Beretania Street/South King Street	126	16	56	2 (Chinatown HD, Hawai'i Capital HD)
Hotel Street/Kawaiaha'o Street/ Kapi'olani Boulevard	228	33	52	2 (Chinatown HD, Hawai'i Capital HD)
King Street/Waimanu Street/ Kapi'olani Boulevard	205	37	50	2 (Chinatown HD, Hawai'i Capital HD)
Nimitz Highway/Queen Street / Kapi'olani Boulevard	218	21	45	3 (Chinatown HD, Merchant St. HD, Hawai'i Capital HD)
Nimitz Highway/Halekauwila Street/ Kapi'olani Boulevard	186	15	33	2 (Chinatown HD, Merchant St. HD)
Waikīkī Branch	33	0	8	0
Total historic or potentially historic resources that may be affected by Alternative 4: 209				

Notes on table:

[1]The numbers in parentheses are the total number of resources that meet the 1965 cut-off date for each section. Because some resources are affected by multiple alignments, the numbers in parentheses are typically less than the total of the resources for each section in column two.

[2]Includes pre-1965 properties from the City and County database, plus other properties identified during field surveys.

[3]PH NHL = Pearl Harbor National Historic Landmark

Construction Impacts

Impacts during construction could include the following:

- Demolition or damage to historic objects

- Alterations (e.g., stabilization efforts/reinforcement, particularly to historic bridges) where such alterations would change the historic appearance
- Inadvertent collision of equipment and/or material into the resource
- Collision from overhead debris
- Construction vibration causing direct movement or resulting in ground displacement (which could cause settling and movement, resulting in structural damage to the resource)
- Dewatering from adjacent foundation excavations, creating settling and movement beneath historic resources
- Dewatering resulting in the rapid dry rot of any previously submerged timber piles when exposed to air
- High concentrations of dust that directly soils the exterior or infiltrates the interior and damages interior architectural features
- Construction noise altering the feeling of historic areas (particularly residential neighborhoods)

Alternative 4: Fixed Guideway

Long-Term Impacts

The Fixed Guideway Alternative could impact the physical environment of 209 historic resources identified along its various alignments (Table 2). As a means of comparing the relative degree of impact that the various alignments in each section would entail, each has been given a ranking from low to high in the far right column of Table 3.

In addition to the number of historic or potentially historic resources identified along each alignment, the rankings take into account several other weighting factors. These factors include the level of impact that would result from where the system is built in a particular area (above-grade, at-grade, and below-grade). For example, at-grade alignments were evaluated as posing less impact than elevated alignments, and tunneled alignments would pose less impact than at-grade alignments. The tunneled alignments were projected to cause the least amount of impact among these three types of alignments, because it is assumed that construction damage would be avoided or minimized and no historic resources adjacent to the tunneled alignments would be affected. The ranking also reflects how many of the resources are already on the National and/or State registers, and the path an alignment takes through a historic district. For example, a lower ranking is given when an alignment is adjacent to the outer boundary of a district, compared to an alignment that goes directly through it.

Of the four alignments within Section I, the Kapolei Parkway/North-South Road alignment has the least potential for impact to historic resources because it is adjacent to only one potentially historic resource. The other three alignments are adjacent to either two or three potentially historic resources. This section contains no properties already listed on the State or National registers and does not contain any historic districts. The system would also be elevated in this section. Therefore the various weighting factors do not affect the ranking of these

alignments. The relative rankings for this section directly reflect the number of potentially historic resources identified in the survey.

Table 3. Historic Resources Affected by the Fixed Guideway Alternative

Section and Alignment[1]	Number of Resources Eligible or Potentially Eligible along Alignment[2]	Historic Districts along Alignment	Relative Potential for Impact[3]
I. Kapolei to Fort Weaver Road (5)			
Kamokila Boulevard/Farrington Highway	2	0	◑
Kapolei Parkway/North-South Road	1	0	○
Saratoga Avenue/North-South Road	3	0	●
Geiger Road/Fort Weaver Road	3	0	●
II. Fort Weaver Road to Aloha Stadium (9)			
Farrington Highway/Kamehameha Highway	9	0	Not ranked; only one alignment
III. Aloha Stadium to Middle Street (10)			
Salt Lake Boulevard	3	1 (Palm Circle NHL)	○
Mauka of the Airport Viaduct	8	1 (PH NHL)	●
Makai of the Airport Viaduct	8	1 (PH NHL)	●
Aolele Street	8	1 (PH NHL)	●
IV. Middle Street to Iwilei (44)			
North King Street	33	0	●
Dillingham Boulevard	12	0	○
V. Iwilei to UH Mānoa (141)			
Beretania Street/South King Street	56	2 (Chinatown HD, Hawai'i Capitol HD)	●
Hotel Street/Kawaiaha'o Street/Kapi'olani Boulevard	52	2 (Chinatown HD, Hawai'i Capitol HD)	●
King Street/Waimanu Street/Kapi'olani Boulevard	50	2 (Chinatown HD, Hawai'i Capitol HD)	◑
Nimitz Highway/Queen Street/ Kapi'olani Boulevard	45	3 (Chinatown HD, Merchant St. HD, Hawai'i Capitol HD)	●
Nimitz Highway/Halekauwila Street/Kapi'olani Boulevard	33	2 (Chinatown HD, Merchant St. HD)	○
Waikīkī Branch	8	0	Not ranked
TOTAL: 209			

[1]Numbers in parentheses following segment titles are the total number of resources on the NR and/or HR, determined eligible, or evaluated as potentially eligible, that could be affected within each section. Because some resources are affected by multiple alignments, the numbers in parentheses are typically less than the total of the resources for each section in column two.

[2]Includes pre-1965 properties from the City and County database, plus other properties identified during field surveys.

[3]○ = Lowest Potential, ● = Highest Potential.

Section II contains only one alignment, Farrington Highway/Kamehameha Highway, which is adjacent to nine potentially historic resources. Because no other alignments exist for comparison purposes, it was not given a ranking.

Four alignments exist in Section III, all of which are proposed to be elevated. The Salt Lake Boulevard alignment has the least potential for impact to historic resources because it is adjacent to only three historic or potentially historic resources. It passes adjacent to the outer boundary of the Palm Circle National Historic Landmark, but none of the landmark's resources are located near this boundary so its direct impact to historic resources in this area is insignificant. The three other alignments in Section III affect eight resources each. They also follow the Kamehameha Highway boundary of the Pearl Harbor National Historic Landmark, passing directly in front of some of its historic resources. These three alignments would result in more impacts to historic resources.

Of the two alignments in Section IV, the Dillingham Boulevard alignment has a lower potential for impacts to historic resources than the North King Street alignment. This is because the Dillingham Boulevard alignment is adjacent to 12 potentially historic resources (of which only one is on one of the registers), and the North King Street alignment is adjacent to 33 historic resources (of which 5 are on either the Hawai'i Register or Eligible for the National Register). Because neither of these alignments passes through or near any historic districts and both use elevated systems, the rankings are primarily based on the historic or potentially historic resources located along the alignments.

Of the five alignments in Section V, the Nimitz Highway/Halekauwila Street/Kapi'olani Boulevard alignment has the least potential for impacts to historic resources. This alignment avoids many areas with concentrated groups of resources (central Chinatown, South King Street), and also avoids the Hawai'i Capital Historic District, which has a number of high-profile resources. However, this alignment does not entirely avoid historic resources. Its elevated route goes through the makai side of the Chinatown Historic District where it is adjacent to 10 resources, and would further isolate that district from its historic connection with the waterfront. It also runs along the border of the Merchant Street Historic District.

The Nimitz Highway/Queen Street/Kapi'olani Boulevard alignment would have the same impacts as the Nimitz Highway/Halekauwila Street/Kapi'olani Boulevard alignment, but would also affect properties within the Hawai'i Capital Historic District (Post Office, Ali'iōlani Hale building, and Attorney General's building). It would also affect three National Register properties along Queen Street (C. Brewer, Alexander and Baldwin, and Royal Brewery buildings). This alignment is fully elevated – there are no tunnels proposed that would reduce the number of historic resources affected.

The Hotel Street/Kawaiaha'o Street/Kapi'olani Boulevard alignment would operate at grade on Hotel Street. This is in context with this street's history, because a streetcar historically ran along it (this precedence notably minimizes but does not eliminate the alignment's impact). This alignment would tunnel under the Hawai'i Capital Historic District, which reduces the number of resources affected to approximately the same number as found along the Nimitz

Highway/Queen Street/Kapi'olani Boulevard alignment. Important resources along the Hotel Street alignment are 18 buildings in the Chinatown Historic District; the National Register-eligible Campbell, McCorriston, and Portland buildings; and five other National Register-listed resources (one Capitol District building, the Kawaiaha'o Church, the Mission Houses, Ala Wai Park Clubhouse, and Church of the Crossroads).

In Section V, the King Street/Waimanu Street/Kapi'olani Boulevard alignment would tunnel under the Chinatown Historic District and Hawai'i Capital Historic District and the National Register-eligible Honolulu Advertiser Building. Koko Head of Ward Avenue, the alignment is similar to the other alignments that would be elevated near the Ala Wai Park Clubhouse and Church of the Crossroads.

The Beretania Street/South King Street alignment within Section V has the highest number of historic resources, but because of the tunneling proposed along the Beretania Street portion of the alignment, fewer resources would actually be affected. Many potentially historic resources identified along South King Street are not listed on either the Hawai'i or National registers. Important resources along the South King Street alignment listed on the National Register are Thomas Square, McKinley High School, the Board of Agriculture and Forestry building, and Church of the Crossroads.

Construction Impacts

Impacts during construction could include:

- Ground displacement and movement of historic properties from tunneling, resulting in structural damage
- Inadvertent collision of equipment and/or material into the resource
- Collision from overhead debris
- Construction vibration, causing direct movement or ground displacement (resulting in settling and movement and possible structural damage to the resource)
- Dewatering from adjacent foundation excavations, creating settling and movement beneath historic resources
- Dewatering, resulting in the rapid dry rot of any previously submerged timber piles when exposed to air
- High concentrations of dust, soiling the exterior or infiltrating the interior and damaging interior architectural features
- Construction noise altering the feeling of historic areas (particularly residential neighborhoods)

Historic Resource Mitigation

Mitigation of Long-Term Impacts

Impacts to historic resources should be avoided and minimized where possible. Other mitigation methods, specifically documentation, should take place if avoiding and minimizing impacts are not practicable. Where the grade-separated

roadway or selected fixed guideway alignment would pose a considerable negative impact on historic resources (in particular where the alignment is above grade and would block the primary façade or view), documentation of the resources prior to construction would be an appropriate method of mitigation. The format of this documentation could be either Historic American Buildings Survey or Historic American Engineering Record reports, as appropriate. If station locations cannot be located away from historic resources, interpretive signs could be installed in the stations located near the affected historic resources. These signs could provide historical and architectural information to transit users.

Mitigation of Construction Impacts

During construction, historic properties located near work areas would be protected from damage. This would include erecting barriers to prevent collision from machinery, equipment, and construction materials, and erecting overhead protection if construction is needed above the resource. Vibration from nearby construction should be monitored at historic resources to avoid damage either directly (e.g., from pile driving) or from ground displacement. Dewatering of the ground under historic resources should be prevented by using watertight excavation support systems (e.g., slurry walls) to ensure that water pumped from a construction site does not come from adjacent properties. Dust suppression measures should be used at construction sites. A monitoring program should be implemented during construction to evaluate the efficacy of protective measures and recommend new measures as needed.

Archaeological Resource Impacts

Alternative 1 (No Build0 and Alternative 2 (Transportation System Management) may involve construction that could impact archaeological resources. However, these impacts are not considered in this analysis, because these alternatives would undergo a separate environmental review as part of their planning and implementation. Most areas affected by Alternative 3, Managed Lane, would also be within the area affected by Alternative 4, Fixed Guideway. Depending on the alignment and construction methods chosen for the Fixed Guideway Alternative, the Managed Lane Alternative could result in fewer impacts on archaeological resources than the Fixed Guideway Alternative, because the Managed Lane Alternative would involve disturbance of a shorter corridor (Table 4).

The potential for encountering archaeological resources is dependent on the construction methods used. Construction of elevated structures requires soil disturbance at periodic intervals where columns are placed, but would not disturb areas between these columns. With tunnel construction, boring machines create deep tunnels below the layer where archeological resources are commonly found, so are not likely to disturb resources except near the ends of the tunnel. Cut-and-cover tunnel construction removes material from the surface, so any resources in the alignment are likely to be disturbed.

Table 4. Summary of Potential Impacts to Archaeological Resources

Alternative	Burials	Pre-Contact Archaeology	Historic Archaeology
Alternative 1: No Build			
No Build Alternative	N/A	N/A	N/A
Alternative 2: Transportation System Management			
TSM Alternative	N/A	N/A	N/A
Alternative 3: Managed Lane (by section)			
3a. Two-Direction Option			
Waiawa IC to Hālawa Stream	○	◑	◑
Hālawa Stream to Pacific Street	◑	◑	◑
3b. Reversible Option			
Waiawa IC to Hālawa Stream	○	◑	◑
Hālawa Stream to Pacific Street	◑	◑	◑
Alternative 4: Fixed Guideway (by section)			
I. Kapolei to Fort Weaver Road			
Kamokila Boulevard/Farrington Highway	○	○	○
Kapolei Parkway/North-South Road	○	○	○
Saratoga Avenue/North-South Road	○	○	○
Geiger Road/Fort Weaver Road	○	◑	○
II. Fort Weaver Road to Aloha Stadium			
Farrington Highway/Kamehameha Highway	○	◑	◑
III. Aloha Stadium to Middle Street			
Salt Lake Boulevard	○	○	○
Mauka of the Airport Viaduct	○	◑	◑
Makai of the Airport Viaduct	○	◑	◑
Aolele Street	○	◑	◑
IV. Middle Street to Iwilei			
North King Street	◑	◑	◑
Dillingham Boulevard	◑	◑	◑
V. Iwilei to UH Mānoa			
Beretania Street/South King Street	◑	◑	◑
Hotel Street/Kawaiaha'o Street/ Kapi'olani Boulevard	●●	●	●
King Street/Waimanu Street/ Kapi'olani Boulevard	●	●	●
Nimitz Highway/Queen Street/ Kapi'olani Boulevard	●	●	●
Nimitz Highway/Halekauwila Street/ Kapi'olani Boulevard	●	●	●
Waikīkī Branch	●	●	●

Notes:

○ = Low Potential, ● = High Potential

The highest potential for encountering burials would occur during cut-and-cover tunnel construction, which would be used on the Hotel Street/Kawaiaha'o Street alignment.

Alternative 3: Managed Lane

In relation to archaeological impacts, no differences exist between Managed Lane Alternative 3a (Two-Direction Option) and 3b (Reversible Option). For the

section of the Managed Lane Alternative from the Waiawa Interchange to Hālawa Stream, the potential to impact burials is rated as low, and the potential to impact archaeological resources and historic resources is rated as medium. The section of the Managed Lane Alternative from Hālawa Stream to Pacific Street has a medium rating for impacts to all archaeological resource types.

Alternative 4: Fixed Guideway

For Section I of the Fixed Guideway Alternative, the potential for impacts to all three types of archaeological resources decreases in direct correlation with an alignment's distance from the coast. The most mauka alignment, Kamokila Boulevard/Farrington Highway, has the least potential to impact archaeological resources. All three mauka alignments (Kamokila Boulevard/Farrington Highway, Kapolei Parkway/North-South Road, and Saratoga Avenue/North-South Road) have a low impact potential for all archaeological resource types. The makai alignment, Geiger Road/Fort Weaver Road, has a medium impact potential for pre-contact archaeological resources and a low impact potential for burials and historic resources.

Only one alignment is being considered for Section II: Farrington Highway/Kamehameha Highway. This alignment has a low impact potential for burials and a medium impact potential for pre-contact archaeological and historic resources.

For Section III, the potential impact to burials is rated low for all four alignments. The potential to impact archaeological and historical resources along the mauka side of the Airport Viaduct, makai of the Airport Viaduct, and Aolele Street alignments is rated medium. For the Salt Lake Boulevard alignment, the potential impact rating for archaeological and historical resources is low, primarily because of the extensive land modification that has occurred in this area.

Both of the alignments for Section IV have medium impact potential for all archaeological resource types.

The alignments along Section V have the greatest potential to impact archaeological resources because of the area's intensive land use history through pre-contact and historic times. Of the six alignments, the most mauka alignment, Beretania Street/South King Street, has a medium impact rating for all archaeological resource types. All other alignments are rated as having a high impact potential for all archaeological resources. The cut-and-cover tunnel excavation for the Hotel Street/Kawaiaha‘o Street/Kapi‘olani Boulevard alignment would have the highest potential for encountering burials because of the large area excavated. The other tunnel alignments, Beretania Street/South King Street and King Street/Waimanu Street/Kapi‘olani Boulevard, would be excavated using a tunnel boring machine, which would not disturb the surface and would dig at a depth generally below where burials are located.

Archaeological Resource Mitigation

Archaeological mitigation would include burial treatment, archaeological data recovery, and archaeological monitoring. If some flexibility in the construction design exists, it may be possible to preserve the archaeological resources in place.

Because a reasonable potential exists for Alternatives 3 and 4 to affect burials, particularly Native Hawaiian burials, the project's program for the treatment of burials should be proactive and conscientious. As a unique class of archaeological resource, burial treatment must be carried out in accordance with the specific guidelines of Hawai'i State and federal burial law. If federal lands are involved, Native American Grave Protection and Repatriation Act guidelines would need to be followed. Early consultation with the O'ahu Island Burial Council is appropriate. A project burial plan should be developed to outline the treatment for all previously identified and inadvertent burial finds encountered by the project.

Archaeological data recovery is a method of extracting important information from archaeological sites to mitigate a project's effect on the site's destruction. In consultation with State Historic Preservation Division, a detailed data recovery plan would be written that describes the data recovery investigation's research questions, data requirements, and methods for acquiring the needed information to answer research questions. Once the archaeological investigation is complete, a data recovery report would be written to document all results.

Archaeological monitoring can minimize the impact of a development on as-yet-unidentified or incompletely documented archaeological resources. The goal is to document exposed archaeological resources and, for the most important archaeological resources, potentially save them from destruction. Typically, archaeological monitoring programs follow a plan that outlines the construction methods and impacts of the proposed project, the types of archaeological resources expected, and the methods to be used to document the archaeological resources encountered. A monitoring report is prepared to document all results.

Archaeological preservation involves avoiding impacts to archaeological resources and protecting and safeguarding these resources in place. Archaeological preservation can include active interpretation of the resource, for example with signage and other forms of public interpretation. It can also involve conserving the resource through evasion. Preservation strategies and methods differ depending on the type of archaeological resource encountered. Typically, a preservation plan is written to describe the archaeological resource and the preservation measures to be enacted. Once approved by the State Historic Preservation Division (SHPD), the plan is implemented.